What is claimed is:

1. A measuring apparatus comprising:

a measuring chip comprising

a dielectric block portion,

a thin film layer formed on one surface of said dielectric block portion, and

a sample holding mechanism for holding a sample on a surface of said thin film layer;

a light source for emitting a light beam;

an optical incidence system for causing said light beam to enter said dielectric block portion at angles of incidence so that a total internal reflection condition is satisfied at an interface between said dielectric block portion and said thin film layer;

photodetection means, which comprises a plurality of light-receiving elements, for detecting intensities of said light beam whose incidence angles are different, totally reflected at said interface;

differentiation means for differentiating an optical detection signal output from each of the light-receiving elements of said photodetection means, in a direction where said light-receiving elements are juxtaposed, at intervals of outputs of two adjacent light-receiving elements; and

computation means for specifying a reference light-receiving element by a predetermined method, then judging whether or not values of the optical detection signals of a first

predetermined number of light-receiving elements increase monotonously in directions going to both sides with said reference light-receiving element as center, and computing a position of a dark line, contained in said light beam reflected at said interface, on the basis of a value obtained by differentiating the outputs of a second predetermined number of light-receiving elements sandwiching said reference light-receiving element when it is judged that the values of the optical detection signals increase monotonously, in said direction where said light-receiving elements are juxtaposed.

2. The measuring apparatus as set forth in claim 1, wherein said predetermined method specifies a light-receiving element, which outputs an optical detection signal having a minimum value, among said plurality of light-receiving elements, as said reference light-receiving element.

3. The measuring apparatus as set forth in claim 1, wherein, when outputs of two adjacent light-receiving elements are differentiated in said direction where said light-receiving elements are juxtaposed, said predetermined method specifies two light-receiving elements whose differentiated value is nearest to 0, as reference light-receiving elements.

4. A measuring apparatus comprising:

a measuring chip comprising

a dielectric block portion,

a thin film layer formed on one surface of said dielectric block portion, and

a sample holding mechanism for holding a sample on a surface of said thin film layer;

a light source for emitting a light beam;

an optical incidence system for causing said light beam to enter said dielectric block portion at angles of incidence so that a total internal reflection condition is satisfied at an interface between said dielectric block portion and said thin film layer;

photodetection means, which comprises a plurality of light-receiving elements, for detecting intensities of said light beam whose incidence angles are different, totally reflected at said interface;

differentiation means for differentiating an optical detection signal output from each of the light-receiving elements of said photodetection means, in a direction where said light-receiving elements are juxtaposed, at intervals of outputs of two adjacent light-receiving elements; and

computation means for computing a position of a dark line that is obtained in actual measurement by computing a distance (L) from a predetermined baseline to the position of said dark line, using the following equation:

$$L = (m - r) \times R - Vr/\alpha r + Vm/\alpha m$$

in which R is a dynamic range per one differential channel when one difference channel comprises two adjacent light-receiving

elements, r is the order of arrangement of a differential channel corresponding to said predetermined baseline, Vr is a voltage value equivalent to a differentiated value that represents said baseline output by the r^{th} differential channel, αr is the differential gradient of the r^{th} differential channel, m is the order of arrangement of a differential channel that detected the dark line contained in the light beam reflected at said interface, Vm is a voltage value equivalent to a differentiated value output by the m^{th} differential channel, and αm is the differential gradient of the m^{th} differential channel.

5. A measuring apparatus comprising:

a measuring chip comprising

a dielectric block portion,

a thin film layer formed on one surface of said dielectric block portion, and

a sample holding mechanism for holding a sample on a surface of said thin film layer;

a light source for emitting a light beam;

an optical incidence system for causing said light beam to enter said dielectric block portion at angles of incidence so that a total internal reflection condition is satisfied at an interface between said dielectric block portion and said thin film layer;

photodetection means, which comprises a plurality of light-receiving elements, for detecting intensities of said light beam whose incidence angles are different, totally

reflected at said interface;

difference means for computing optical detection signals based on outputs of said light-receiving elements and computing a difference between said optical detection signals with the space of at least one light-receiving element in a direction where said light-receiving elements are juxtaposed; and

computation means for measuring a state of attenuated total reflection, based on said difference computed by said difference means.

6. The measuring apparatus as set forth in claim 5, wherein said optical detection signal is an average value obtained by dividing said plurality of light-receiving elements into light-receiving element groups containing a predetermined number of light-receiving elements which are at least two adjacent light-receiving elements, and then averaging outputs of the light-receiving elements of each of said light-receiving element groups.

7. The measuring apparatus as set forth in claim 5, wherein said optical detection signal is an average value obtained by serially computing an average value of at least two adjacent light-receiving elements in said direction where said light-receiving elements are juxtaposed.

8. The measuring apparatus as set forth in claim 5, wherein

said computation means measures said state of

attenuated total reflection by measuring a state of the dark line contained in said light beam; and

the pitch between said light-receiving elements is one-fourth or less of the half-value width of said dark line.

9. The measuring apparatus as set forth in claim 6, wherein

said computation means measures said state of attenuated total reflection by measuring a state of the dark line contained in said light beam; and

the pitch between said light-receiving elements is one-fourth or less of the half-value width of said dark line.

10. The measuring apparatus as set forth in claim 7, wherein

said computation means measures said state of attenuated total reflection by measuring a state of the dark line contained in said light beam; and

the pitch between said light-receiving elements is one-fourth or less of the half-value width of said dark line.

11. The measuring apparatus as set forth in claim 5, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

12. The measuring apparatus as set forth in claim 6, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

13. The measuring apparatus as set forth in claim 7, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

14. The measuring apparatus as set forth in claim 8, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

15. The measuring apparatus as set forth in claim 9, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

16. The measuring apparatus as set forth in claim 10, further comprising sensitivity correction means for correcting for a difference in sensitivity between the light-receiving elements of said photodetection means.

17. The measuring apparatus as set forth in claim 11, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.

18. The measuring apparatus as set forth in claim 12, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.

19. The measuring apparatus as set forth in claim 13, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements

difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.

20. The measuring apparatus as set forth in claim 14, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.

21. The measuring apparatus as set forth in claim 15, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.

22. The measuring apparatus as set forth in claim 16, wherein said sensitivity correction means corrects for a difference in sensitivity between the light-receiving elements of said photodetection means by processing signals.